AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

H

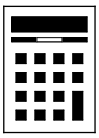
Higher Tier Paper 3 Calculator

Monday 10 November 2025 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26	
TOTAL	

Answer **all** questions in the spaces provided.

1 Solve $\frac{2}{5}x = 7$

[2 marks]

$x =$ _____

2 Factorise fully $x^2 - 16$

[1 mark]

Answer _____

3 Here is some information about the number of people at a musical on three days.

	Number of people
Thursday	160 people
Friday	25% more than Thursday
Saturday	10% more than Friday

How many people were at the musical on **Saturday**?

[3 marks]

Answer _____

Turn over for the next question

4 Mo and Nik share some money.

Mo gets,

- $\frac{3}{5}$ of the money
- £810

Mo gives £380 to charity.

Nik gives 45% of his money to charity.

In **total**, how much money do they give to charity?

[4 marks]

Answer £ _____

5 The term-to-term rule of a sequence is

double the previous term and add 7

The first term is

$3b - 5$

Work out the **third** term.

[3 marks]

Answer _____

Turn over for the next question

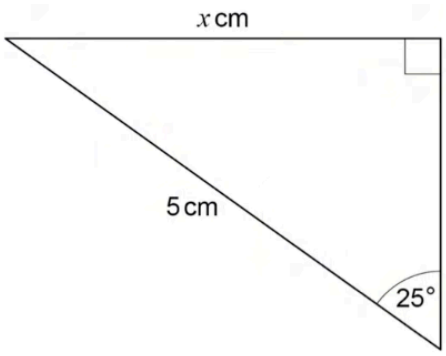
6 The angles of a quadrilateral are in the ratio 2 : 3 : 3 : 4

Work out the **largest** angle.

[3 marks]

Answer _____ °

7



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Use trigonometry to work out the value of x.

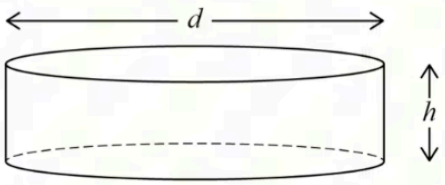
You **must** show your working.

[3 marks]

$x =$ _____ cm

Turn over for the next question

8 An ice hockey puck is a cylinder.



The mass of the puck is 170 g

8 (a) Work out the density of the puck when $d = 7.6\,\text{cm}$ and $h = 2.5\,\text{cm}$

State the units of your answer.

[4 marks]

Answer _____

8 (b) In fact, $d = 7.62\,\text{cm}$ and $h = 2.54\,\text{cm}$

Without further calculation, how does this affect the density?

Tick **one** box.

[1 mark]

- ☐ The density is greater than the answer to part (a)
- ☐ The density is less than the answer to part (a)
- ☐ The density is the same as the answer to part (a)
- ☐ It is not possible to tell

Turn over for the next question

9 In a game, each player rolls an ordinary dice.

- If they roll a 6 they roll the dice again.
- If they then roll another 6 they do **not** roll again.

1038 people each play the game once.

Altogether, the dice is rolled 1092 times.

Do you think the dice is biased?

Tick a box.

Yes ☐ No ☐

Show working to support your answer.

[3 marks]

10 Write down the only **regular** polygon where

size of interior angle < size of exterior angle

[1 mark]

Answer _____

11 Amin is trying to throw a ball into a cup.

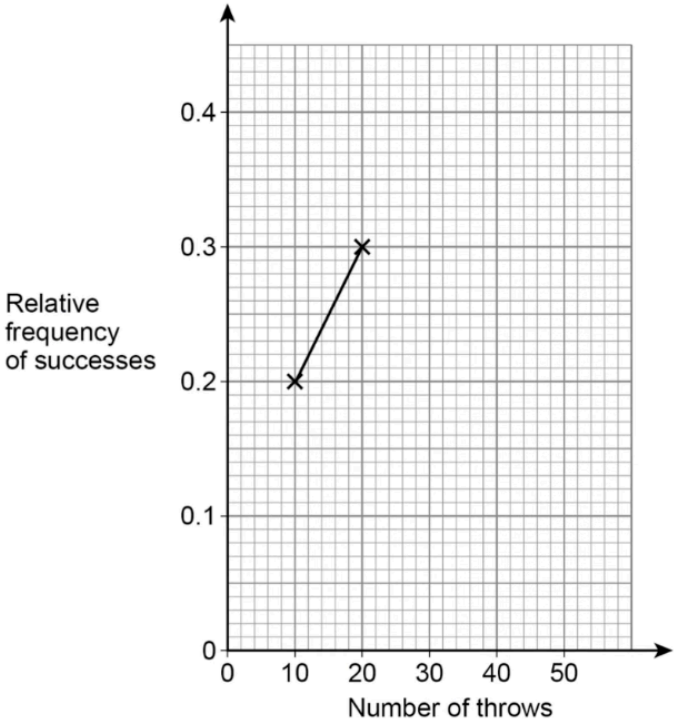
He throws the ball 50 times.

He records the number of times the ball lands in the cup for every 10 throws.

Throws	1 – 10	11 – 20	21 – 30	31 – 40	41 – 50
Number of successes	2	4	6	2	2

11 (a) Complete the relative frequency graph for the data.

[3 marks]



11 (b) Write down the best estimate of the probability of a successful throw.

[1 mark]

Answer _____

12 Four people, A, B, C and D take part in a game.

- Only A or B can finish in 1st position.
- A **cannot** finish in 4th position.

12 (a) Complete the table to show the other **nine** possible finishing positions.

[3 marks]

1st	2nd	3rd	4th
A	B	C	D

12 (b) Assume that all the finishing positions are equally likely.

Work out the probability that the first two positions are filled by A and B in either order.

[1 mark]

Answer _____

12 (c) In fact, the finishing positions are **not** equally likely.

What does this mean about the probability that the first two positions are filled by A and B in either order?

Tick **one** box.

[1 mark]

- ☐ It is less than the answer to part (b)
- ☐ It is the same as the answer to part (b)
- ☐ It is greater than the answer to part (b)
- ☐ It is not possible to tell

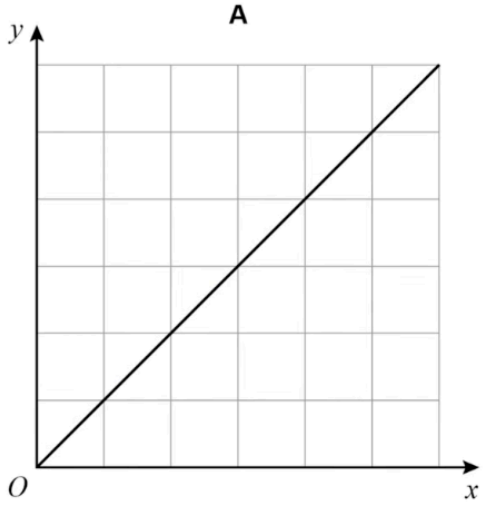
Turn over for the next question

13 y is inversely proportional to x

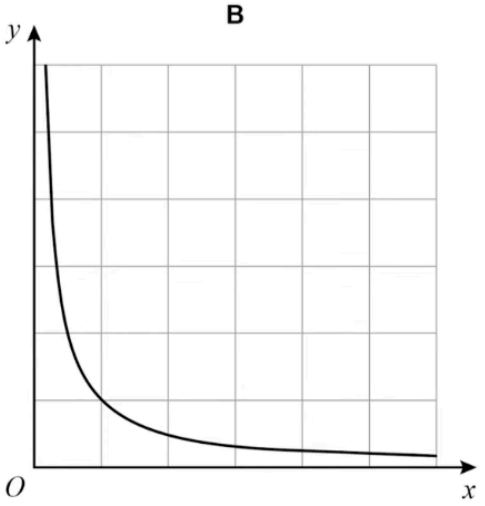
Circle the letter above the graph that shows this.

[1 mark]

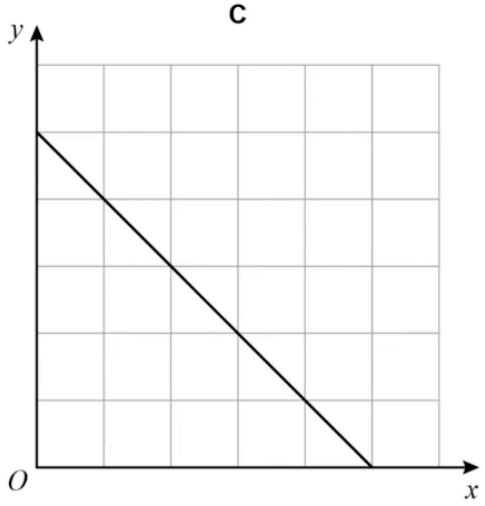
A



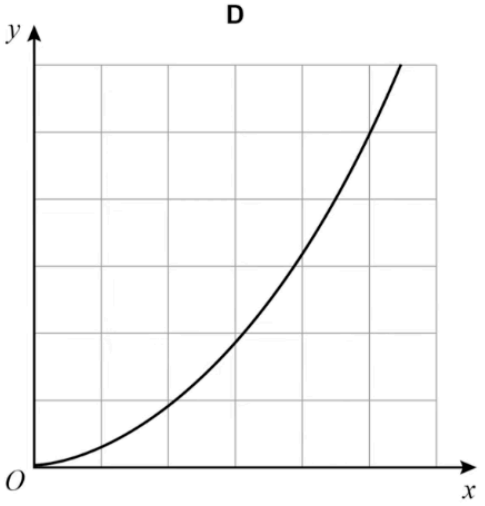
B



C



D



14 *ABCDE* is a pentagon.

$x : y = 1 : 3$

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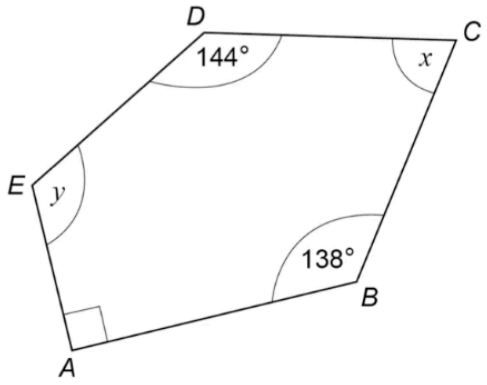


Prove that *AB* and *DC* are parallel.

[4 marks]

15 100 g of a cake contains 30 g of flour.

$\frac{1}{6}$ of the same cake contains 27.5 g of flour.

Work out the mass of the whole cake.

[3 marks]

Answer _____ g

16 AC and BD are the diagonals of rhombus $ABCD$.

A is $(-1, 3)$ and C is $(7, -2)$

16 (a) Work out the gradient of BD.

[3 marks]

Answer _____

16 (b) Work out the coordinates of the point where AC and BD intersect.

[2 marks]

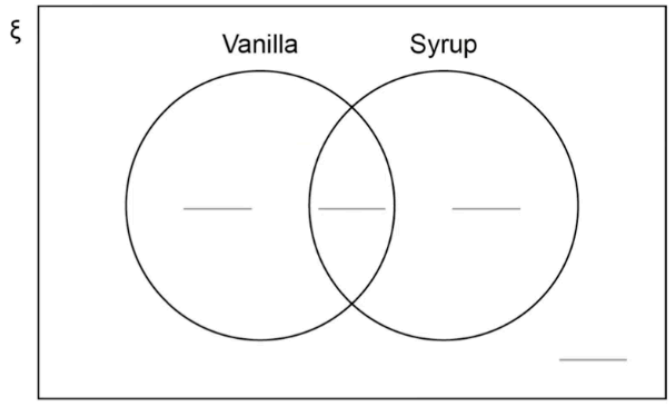
Answer (_____ , _____)

17 100 ice creams were sold.

- 36 were vanilla ice creams.
- 12 of the vanilla ice creams had syrup on.
- 59 of the ice creams had syrup on.

17 (a) Complete the Venn diagram.

[3 marks]



17 (b) Two of the **vanilla** ice creams are chosen at random.

Work out the probability that exactly **one** of them has syrup on.

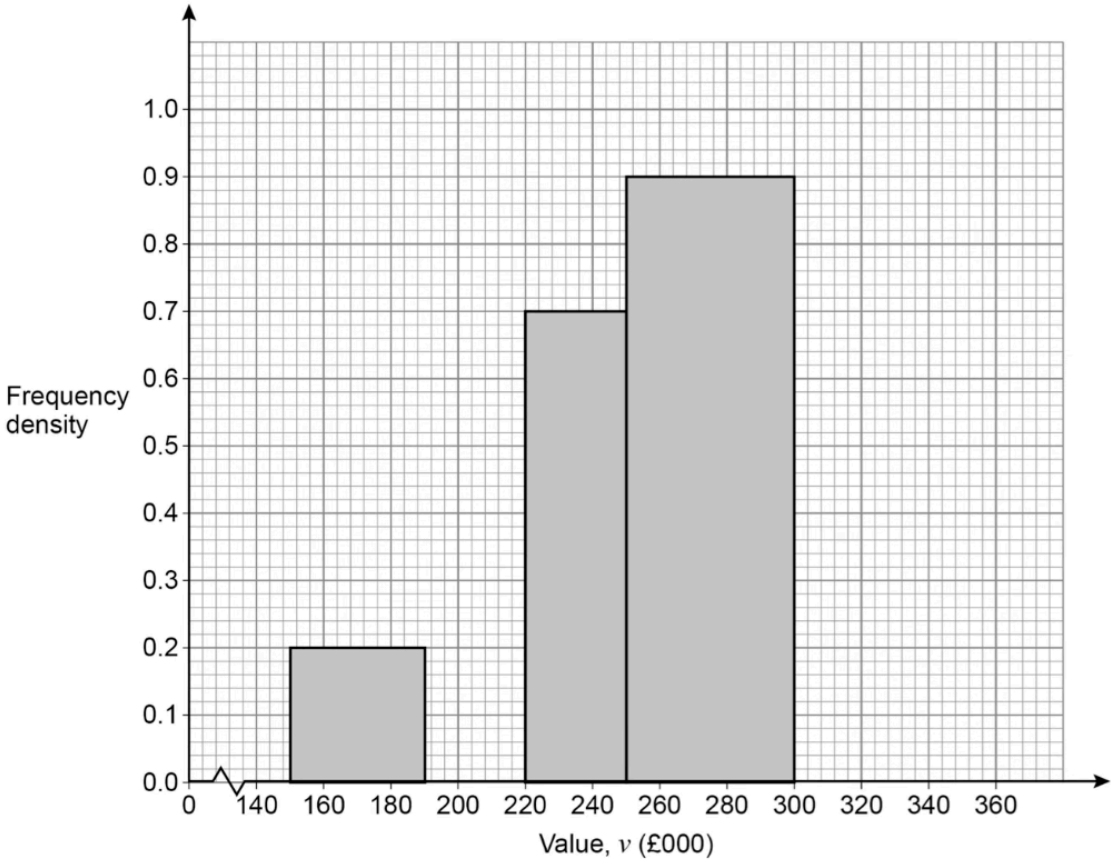
[3 marks]

Answer _____

Turn over for the next question

18 The table and histogram show some information about the value of 90 houses.

Value, v (£000)	Frequency
$150 \leqslant v < 190$	
$190 \leqslant v < 220$	12
$220 \leqslant v < 250$	
$250 \leqslant v < 300$	45
$300 \leqslant v < 350$	4

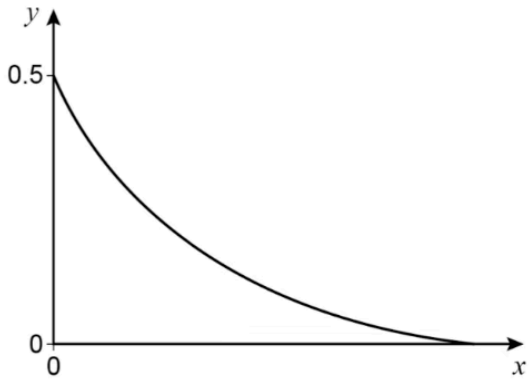


Complete the table and the histogram.

[4 marks]

19 Marnie wants to sketch the graph of $y = 0.5^x$ for $x \geqslant 0$

Here is her attempt.



Make **two** criticisms of her graph.

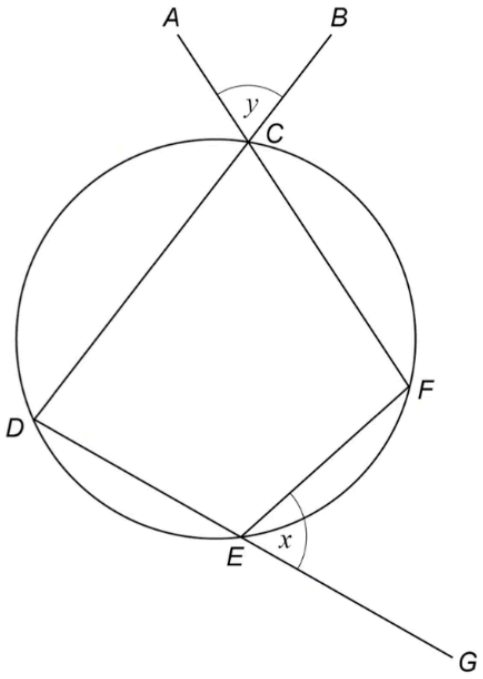
[2 marks]

Criticism 1

Criticism 2

20 *C*, *D*, *E* and *F* are points on a circle.

ACF, *BCD* and *DEG* are straight lines.



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Prove that $y = x$

Give a reason for each stage of your working.

[3 marks]

21 y is **inversely** proportional to x^2

$y = 32$ when $x = 0.5$

21 (a) Work out an equation connecting y and x.

[3 marks]

Answer _____

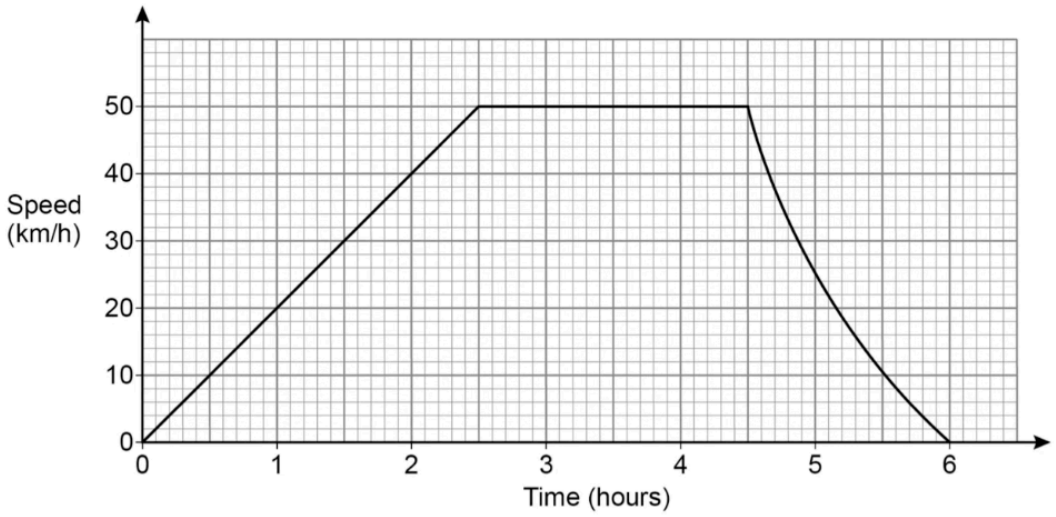
21 (b) Work out the value of y when $x = 5$

[2 marks]

$y =$ _____

Turn over for the next question

22 The speed-time graph for a train journey is shown.



22 (a) Estimate the average speed of the train for this journey.

You **must** show your working.

[4 marks]

Answer _____ km/h

22 (b) Is your answer to part **(a)** likely to be an underestimate or an overestimate?

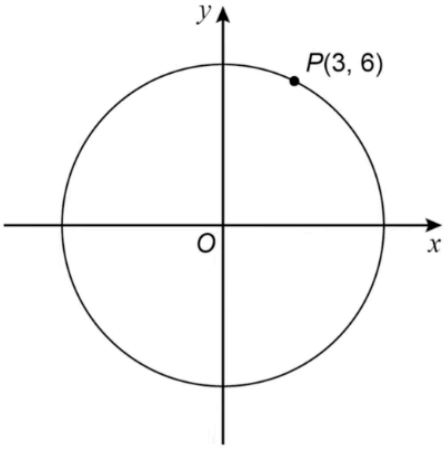
Tick a box.

☐ Underestimate ☐ Overestimate

Give a reason for your answer.

[1 mark]

23 *P* is the point (3, 6) on a circle, centre *O*.



Not drawn accurately

Work out the equation of this circle.

[2 marks]

Answer _____

24 A solution to an equation is found using the iterative formula

$$x_{n+1} = \sqrt[3]{2x_n + 6} \quad \text{with} \quad x_1 = 3$$

24 (a) Work out the values of x_2 and x_3

Give your answers to 5 decimal places.

[2 marks]

$x_2 =$ _____

$x_3 =$ _____

24 (b) Work out the solution to 5 decimal places.

[1 mark]

$x =$ _____

END OF QUESTIONS